

CLAIMS

1. A method of coating a substrate (12), the method being the type comprising:
 - placing the substrate (12) in an enclosure (14) under vacuum;
 - forming a gas by evaporating a component that is liquid at atmospheric pressure and at ambient temperature;
 - introducing the gas into the enclosure (14); and
 - decomposing the gas;

the method being characterised by introducing a complementary gas into the enclosure (14) for the purpose of reacting with the decomposed gas so as to form, on the substrate (12), at least one thin layer, referred to as thin layer A.

2. A method of coating a substrate (12) according to claim 1, in which the component (28) is made up of organic and inorganic groups, e.g. of silicone.
3. A method of coating a substrate (12) according to claim 1 or claim 2, in which the complementary gas is monomolecular up to at least 90%.
4. A method of coating a substrate (12) according to claim 3, in which the complementary gas comprises, for the most part, either dioxygen, or argon, or di-nitrogen, or dihydrogen, or acetylene.
5. A method of coating a substrate (12) according to any one of claims 1 to 4, in which the gas is decomposed with the help of electric plasma-creation means (40).
6. A method of coating a substrate (12) according to any one of claims 1 to 5, further comprising a step of forming another thin layer, referred to as a thin layer B, on the substrate, by vacuum deposition after or before forming the thin layer A.

7. A method of coating a substrate according to claim 6, in which said thin layers A and B are formed without extracting the substrate (12) from the enclosure (14) between forming each layer.

8. A method of getting a substrate (12) according to claim 6 or claim 7, in which the thin layer A is formed after the thin layer B in such a manner as to cover said thin layer B, in particular in order to provide it with mechanical and/or chemical protection.

9. A method of coating a substrate (12) according to claim 6 or claim 7, in which the thin layer B is formed after the thin layer A in such a manner that said thin layer A encourages smoothing the substrate and/or bonding the thin layer B.

10. A method of coating a substrate (12) according to any one of claims 6 to 9, in which the thin layer B is a layer of metalization.

11. A method of coating a substrate (12) according to claim 10, in which the layer of metalization is formed by evaporating a solid component.

12. A method of coating a substrate (12) according to claim 10, in which the layer of metalization is formed by evaporating an organometallic component that is in the liquid phase at ambient temperature and at atmospheric pressure.

13. A method of forming a coloured film on a substrate (12), the method being the type in which at least two thin layers having different refractive indices are deposited on the substrate, the method being characterized in that at least one of the thin layers is obtained by a coating method according to any one of claims 1 to 5.

14. A device for implementing a method of coating a substrate (12) according to any one of claims 1 to 12, the device being characterised in that it comprises:

- an enclosure (14) for housing the substrate (12);
- the tank (26) external to the enclosure (14) for containing a liquid component (28);
- first admission means (18) for admitting a gas into the enclosure and comprising means (24) for connecting the enclosure (14) to a portion of the tank (26) containing a vapour phase of the gas-forming liquid;
- means (40) for decomposing the gas; and
- second admission means (32) for admitting a complementary gas for reacting with the decomposed gas.

15. A coating device (10) according to claim 14, in which the admission means (18, 32) include means (22, 36) for adjusting the admission flow rate of the gas.

16. A coating device according to claim 14 or claim 15, further comprising means (16) for creating a vacuum in the enclosure (14).

17. A coating device according to any one of claims 14 to 16, in which the gas-decomposition means are electric means (40) for generating a plasma inside the enclosure (14) from the gas.